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THE RODINA-47 RECEIVER

M. Zhuk

The Rodina-47 receiver, also sometimes called the Elektrosignal-3 is designed on the pattern of the well-known Rodina battery receiver. It is an all-wave battery superheterodyne, working on small, 2-volt tubes. Its wave bands are as follows: long wave 2,000-732 meters (150-410 kilocycles); medium wave 576-200 meters (520-1,500 kilocycles); short wave 70-25 meters (4,300-12,000 kilocycles). Intermediate frequency is 460 kilocycles. The first stage of the receiver is a converter (an SB-242 tube), followed by two IF amplifier stages (2K2M tubes). A diode detector and preliminary audio pre-amplifier are combined in a 2Zh2M tube, in which the cathode and plate are used as a diode for detecting, while the cathode, control grid, and screen grid form a triode for audio amplification. The two-stage output cascade (2Zh2M tubes) is connected to the preceding stage through a transformer.

There is one IF band filter in the receiver, inserted in the plate circuit of the converter. The IF amplifier tubes are connected together through self-contained circuits using capacitive coupling. The receiver has a Type MN-5 neon indicator lamp connected in series with a dropping resistor which assures proper filament voltage.

There are a few basic differences between this and the Rodina circuit. The main ones are as follows:

1. On the receiver input, there is an LC series filter, tuned by means of its core, which by-passes to ground any signals near the intermediate frequency.

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2. The method of connecting the dropping resistor to the filament circuit differs. In the Rodina receiver there is a separate terminal for connecting the filament battery through a supplementary resistor. The positive wire of the filament is connected to one or the other of the terminals, depending on the voltage of the filament battery. In the Elektrosignal-3 receiver, there is one terminal for the positive filament wire, and the supplementary resistor can be short circuited by means of a tie piece provided at the rear of the chassis.

3. A third difference is the provision of outlets for connecting an additional loudspeaker. These outlets are carried out in the form of two symmetrical leads from the primary winding of the two-stage output transformer.

4. A fourth difference is the negative feedback in the output cascade. The negative feedback voltage is applied to the control grids of the output tubes by means of an RC circuit. At low frequencies the negative feedback will be stronger than at high frequencies, thereby accentuating the high frequencies and attenuating the low ones.

The receiver output is about 0.2 watt. The filament current is 0.5 ampere at 2 volts; plate current at 120 volts is 8 milliamperes. The receiver operates stably with plate voltages of 80-160 volts.

Merits and Defects of the Receiver

The changes effected in the circuit of the Elektrosignal-3 receiver as compared with its prototype, the Rodina receiver, are fully justified. The input filter does away with some of the interference. The negative feedback helps decrease distortion, and improves reception quality. Replacing the superfluous terminal for connecting the A+ battery by a tie piece which short circuits the filament resistor somewhat simplifies this phase of receiver operation.

Finally, one must welcome the outlet arrangement for connecting the additional loudspeaker, which considerably adds to the usefulness of the receiver. The connection of additional loudspeakers (the receiver takes two extra loudspeakers without difficulty) enables two rooms or a house to be radiofied. This is extremely important under rural conditions.

Moreover, the existence of this outlet enables the dynamic loudspeaker of the receiver to be used in conjunction with a radio rebroadcasting network. Thus, if such a network exists, there is no need to waste the batteries listening to broadcasts which are carried by the network. Furthermore, better reproduction can be obtained than by using the loudspeakers ordinarily provided for these networks. Finally, if the dynamic loudspeaker fails, the receiver can be operated with an external loudspeaker. All this is very important and the plant not identified did well to provide the receiver with this outlet. The need for this extra pair of jacks can be judged by the fact that when the Rodina receiver was first produced numerous queries were received concerning the methods of connecting an additional loudspeaker.

One of the structural differences in the Elektrosignal-3 receiver is that the batteries are not in the same cabinet with the receiver. As is known, in the Rodina receiver the batteries are placed inside the cabinet, but this cannot be reckoned an advantage. In the first place, it must be noted that the batteries usually used for this receiver (BNS, MVD-500, and BS-70) do not fit in the cabinet. Moreover, the fumes generated at the galvanic elements have a deleterious effect on the assembly. Many users have complained.

Although many improvements have been made in feeding the receiver, the plant has not adequately solved the problem of connecting the receiver with the

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batteries. The ends of the leads are bared of insulation and have to be connected to the battery terminals in the most primitive fashion. This arrangement is not mechanically durable -- after being connected a few times the ends of the wires break off. It is also bad from an electrical standpoint, because the surface of bare wires is always covered with oxides which do not come off when the wire is hooked up. Moreover, the twist method of joining is slovenly in appearance and dangerous as regards short circuits. Radio listeners do not always insulate the twists, and short circuits between the bare parts of the wire are quite possible. There can be two results of short-circuiting: damage to the battery or burning out all the tubes. We find it difficult to say which of these "results" is the worse.

It must further be stated that the EIS-3 does not have all the features desirable in a receiver of this type. A socket for a crystal and telephone set for listening to powerful nearby stations without wasting the batteries would have been useful. It would be a good thing to fit an adapter input to the receiver. It is needed in many cases, for example, for using the receiver amplifier to amplify rebroadcast network programs if they are not loud enough, for operating from a crystal receiver, etc. The designers did not do all that could have been done regarding such conveniences.

In conclusion, there is one more point to be made. The Elektrosignal-3, like the Rodina receiver, is a six-tube battery-fed superheterodyne and can be regarded as a "heavy" receiver. "Lighter" receivers are also needed. The country radio listener is now forced to choose between a crystal set and a heavy, six-tube all-wave superheterodyne, i. e., between two extremes. Industry does not restrict itself to producing bicycles and gleaming, multiseat ZIS-110s. IT also produces motorcycles of various types and the Moskvich and Pobeda light cars. The rural-radio-receiver line should also have its Pobedas and Moskviches.

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